

## PERFORMANCE OF ROSE VARIETIES FOR GROWTH AND FLOWERING UNDER NAGPUR (MAHARASHTRA) CONDITIONS

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### ABSTRACT

A field investigation entitled “Performance of rose varieties for cut flower production under Nagpur conditions” was carried out during winter season of the year 2014-2015 at Farm of Horticulture Section, College of Agriculture, Nagpur. The experiment was laid out in Randomized Block Design with three replications and ten treatments. The treatments comprised of ten varieties viz., Golden Madeillon, Paradise, Black Lady, Double Delight, Toro, Naranga, Gladiator, John F. Kennedy, Centenary and Peter F. The Significantly maximum plant height (91.53) and leaves branch<sup>-1</sup> (31.60) were recorded in variety Gladiator with a minimum thorn intensity (3.33) among all other varieties. However, maximum branches plant<sup>-1</sup> (15.93) and maximum leaf area (72.72) were recorded in the Paradise variety, whereas, maximum internodal distance (5.42) has been observed in Peter F variety. In respect of flowering parameters, minimum days to initiation of flower bud (13.60), days to 50 per cent of flowering (26.33) in rose was recorded in the variety Toro. However, minimum days to first harvest (20.33) and maximum flowering span (159 days) were recorded in variety Paradise.

(Key words: Rose, growth, flowering)

### INTRODUCTION

Floriculture is one of the most important branch of Horticulture in aesthetic, social and commercial sense. It has been closely associated with Indian culture from Vedic times. Now days, there is great demand for cut flowers in local and export market. The important flowers having more demand are Rose, Gerbera, Carnation, Gladiolus, Chrysanthemum, Marigold, Aster, Orchids etc.

Under floriculture crops in India was around 233 thousand hectares with the production of 1729 thousand metric tonnes of loose flowers and 76732 lakh number of cut flowers. (Anonymous, 2013).

Rose (*Rosa hybrida* L.) belongs to the family Rosaceae and remains a major ornamental plant for cut flower trade all over the world. It is commercially cultivated in India for making bouquets, interior decoration, garlands, religious and social functions, floral arrangements and cut flower purposes. It occupies special importance due to its hardiness, easy culture including inexpensive packaging, low pest damage and wider adaptability to varied agro climatic conditions.

For commercial cultivation of roses, the variety should be selected which can produce more quality blooms on long stems and having more demand in the market. Accordingly the varieties selected which can produce quality blooms are Paradise, Gladiator, Folklore American pride, Double Delight, Toro etc. Hence, keeping above

aspects in view the present investigation was under taken under Nagpur conditions.

### MATERIALS AND METHODS

The present investigation was carried out at Horticulture section, College of Agriculture, Nagpur during September 2014 to March 2015 to study the performance of rose varieties for cut flower production under Nagpur conditions. The research was carried out based on Randomized Block Design with three replications. Ten treatments with ten rose varieties (Golden Madeillon, Paradise, Black Lady, Double Delight, Toro, Naranga, Gladiator, John F. Kennedy, Centenary and Peter F.) were planted. All standard agricultural practices of rose production were done as recommended. Five plants were selected randomly from each plot for recording various growth parameters viz., plant height (cm), stem diameter (cm), branches plant<sup>-1</sup>, leaves branch<sup>-1</sup>, thorn intensity, internodal distance (cm) and flowering parameters like days to initiation of flower bud, days to 50 % flowering, days to first harvest and flowering span were recorded on these randomly selected plants. Data were statistically analysed in RBD (Gomez and Gomez, 1984).

### RESULTS AND DISCUSSION

The data presented in table 1 revealed that,

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different varieties had significant effect on all growth and flowering parameters of Rose.

#### **Growth parameters**

Significantly maximum plant height was recorded in variety Gladiator (91.53 cm) which was followed by variety Golden Madellion (75.47 cm). However, significantly, minimum plant height was recorded in variety Black Lady (56.00 cm). From the above results it is noticed that, maximum plant height was observed in variety Gladiator. This might be due to the difference in genotypic constitution of the varieties. These results are in close agreement with findings of Lundstad (1975) in rose. He found maximum plant height in cultivar Scarlet Elizabeth (84 cm). Muhammad et al. (2011) recorded maximum growth parameters viz., plant height, number of branches and leaf area in cv. Autumn sunset and gruss-an-7 ephiz in rose.

No significant difference in stem diameter was recorded among all the varieties. However, maximum stem diameter was recorded in variety Gladiator (1.54 cm). Whereas, minimum stem diameter was recorded in variety Black Lady (1.14 cm). This might be due to the difference in genotypic constitution of the varieties. Similar results were in accordance with the investigation of Gowda *et al.* (1980), who evaluated eight hybrid tea roses for cut flowers. The stem diameter was found to be maximum in Mainauperle (1.46 cm) and minimum in Christian Dior (1.26 cm).

Maximum number of branches plant<sup>-1</sup> was recorded in variety Golden Madellion (15.93) which was at par with Paradise (15.67), Black Lady (15.60), Gladiator (15.27) and Centenary (15.43). Whereas, significantly minimum number of branches plant<sup>-1</sup> was recorded in Double Delight (11.87). This might be due to inherent genetic factors promote the higher production of substances like Malic hydrazide (MH), auxins and cytokinin. The variation in different varieties might be due to different genetic makeup of the varieties. Mohanty *et al.* (2011) carried out an investigation during 2006-2007 to study the comparative performance of rose varieties viz., Gladiator, Minuparle and Montezuma under four growing environments viz., open field, 50 per cent and 75 per cent shade net and polyhouse condition. Montezuma performed very well with respect to several growth characters which recorded maximum plant height (60.94 cm), highest number of second order laterals (6.69) and maximum plant spread N-S (53.72 cm) and E-W (35.60 cm) direction.

Significantly maximum number of leaves branch<sup>-1</sup> was recorded in variety Gladiator (31.60) which was at par with the varieties Golden Madellion (29.47), Naranga (29.90), John F. Kennedy (29.77) and Centenary (29.57). Whereas, minimum number of leaves branch<sup>-1</sup> was recorded in Double Delight (22.77). This might be due to inherent genetic factors, higher sprouting of auxiliary buds, endogenous production of cytokinins, auxins and gibberellins. The results obtained during this investigation are in close agreement with the findings of Mendhe *et al.* (2011) who studied on rose (*Rosa indica* L.) cv. Gladiator to study the effect of different levels of pruning on growth and flowering of rose (*Rosa indica* L.)

cv. Gladiator. In this investigation roses were pruned at different levels viz., 10 cm, 20 cm, 30 cm, 40 cm, 50 cm and 60 cm from ground levels. Maximum number of leaves was observed in plants pruned at 50 cm.

Significantly minimum thorn intensity was recorded in variety Gladiator (3.33) which was at par with Paradise (3.53) and John F Kennedy (5.13). Whereas, significantly maximum thorn intensity of plant was recorded in Naranga (11.27). This might be due to the genetic variability in the varieties which increased thorn intensity plant<sup>-1</sup>. The results obtained during this investigation are in close agreement with the finding of Gowda *et al.* (1980), who studied that the density of thorns per 2.5 cm shoot was observed to be maximum in Mainauperle (6.25) and minimum in pink Parafait (2.25).

Significantly maximum leaf area was recorded in variety Paradise (72.72) which was at par with the varieties Black Lady (69.76), Double Delight (71.60), Naranga (72.45), Gladiator (72.45), John F Kennedy (69.71) and Peter F. (70.89). Whereas, significantly minimum leaf area of plant was recorded in Centenary (67.57). This might be due to the genetic variability in the varieties which increased leaf area among the varieties. The results obtained during this investigation are in close agreement with the finding of Nagaraj (1996), who carried out an experiment to know the influence of growing condition on growth parameters of exotic rose cultivars viz., Kiss, Vivaldi, Yunone, Eterna and Gladiator under polyhouse condition. Among the cultivars Kiss recorded better growth parameters.

Significantly maximum internodal distance was recorded in variety Peter F. (5.42 cm) which was at par with the variety Golden Madellion (5.05 cm). Whereas, significantly minimum internodal distance was recorded in John F. Kennedy (3.79 cm). This might be due to increase in genetic constitution of three varieties and also due to the higher concentration of gibberellins in shoots which may retain the shoots in vegetative phase. The results are in agreement with those reported by Bhattacharjee (1993), who studied the effect of gibberellic acid on growth, flowering, flower quality and post harvest life of *rosa hybrida* cv. Raktagandha and found to have maximum internodal distance with the application of gibberellic acid.

#### **Flowering parameters**

Significantly, an early flower bud emergence was recorded in variety Toro (13.60 days) which was at par with variety Centenary (14.33 days). Whereas, maximum days to flower bud emergence was recorded in variety Peter F (18.67 days). This might be due to the inherent genetic factors and production of plant growth hormones like auxins, cytokinins, gibberellins and ethylene. The results are in close agreement with findings of Mohanty *et al.* (2011). They carried out experiment on three rose varieties in Bhubaneswar, Orissa and reported that among three varieties Gladiator took minimum time for bud appearance after pruning.

Significantly, minimum days to 50% flowering were recorded in Toro variety (26.33 days) which was at par with

**Table 1 Growth and flowering as influenced by different varieties of rose**

Treatments	Plant height (cm)	Stem diameter (cm)	Branches plant <sup>-1</sup>	Leaves branch <sup>-1</sup>	Thorn intensity (15 cm)	Leaf area plant <sup>-1</sup> at 50% flowering stage	Intermodal distance (cm)	Days to initiation of flower bud	Days to 50% flowering	Days to first harvest	Flowering span (days)
T <sub>1</sub> – Golden Madeillon	75.47	1.49	15.93	29.47	7.10	69.30	5.05	17.87	31.33	25.00	155.00
T <sub>2</sub> - Paradise	68.73	1.42	15.67	24.27	3.53	72.72	4.81	15.20	34.67	20.33	159.67
T <sub>3</sub> - Black Lady	56.00	1.14	15.60	23.37	8.60	69.76	4.50	17.93	30.67	26.33	153.67
T <sub>4</sub> – Double Delight	59.47	1.39	11.87	22.77	5.73	71.60	4.27	17.40	28.67	27.00	153.00
T <sub>5</sub> - Toro	61.93	1.21	11.93	23.27	6.47	69.45	3.96	13.60	26.33	28.67	151.33
T <sub>6</sub> - Naranga	58.47	1.47	12.40	29.90	11.27	72.45	4.11	15.33	30.67	22.33	157.67
T <sub>7</sub> - Gladiator	91.53	1.54	15.27	31.60	3.33	72.45	4.46	15.73	30.67	24.00	156.00
T <sub>8</sub> – John F. Kennedy	67.93	1.39	13.80	29.77	5.13	69.71	3.79	16.27	32.00	29.67	150.33
T <sub>9</sub> - Centenary	61.07	1.26	15.43	29.57	7.20	67.57	3.88	14.33	29.67	25.67	154.33
T <sub>10</sub> - Peter F.	67.53	1.29	12.67	26.43	9.87	70.89	5.42	18.67	41.00	31.33	148.67
SE (m) ±	2.270	0.110	0.332	1.461	0.710	1.053	0.150	0.472	1.052	0.691	0.691
CD at 5%	6.771	0.329	0.992	4.350	2.127	3.141	0.442	1.410	3.140	2.050	2.050

Double Delight (28.67 days). Whereas, maximum days to 50% flowering were recorded in Peter F (41 days). Early flowering might be due to the inherent genetic factors and production of plant growth hormones like auxins, cytokinins, gibberellins and ethylene. The results are in close agreement with findings of Mohanty *et al.* (2011). They carried out experiment on three rose varieties in Bhubaneswar, Orissa and reported that among three varieties Gladiator took minimum time for bud appearance after pruning.

Significantly minimum days were required to harvesting in variety Paradise (20.33 days) which was at par with Naranga (22.33 days). Whereas, significantly maximum days was required to harvesting in variety Peter F. (31.33 days). This might be due to fact that, variation in the genetic and physiological differences among varieties. Similar results were found by Fascella and Zizzo (2007), who evaluated the red rose cultivars and reported that the cultivar Maira had the earliest flowering (108 days after planting).

The data showed significant differences in flowering span among different varieties of roses. Variety Paradise had recorded maximum flowering span (159.67 days) which is at par with Naranga (157.65 days) and the variety Peter F. reported minimum flowering span (148.67 days). The differences in flowering span might be due to the varietal characteristics of those varieties. The results are in accordance with Chauhan *et al.* (2014), they studied the effect of different media on growth, flowering and cut flower yield of gerbera under protected condition. Longest flowering span (141.97 days) was found under the treatment of media amended with normal soil + rice husk + coco peat + castor cake + vermicompost (1:1:1:1:1).

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